COPY FOR MR. J. ALLAN ROSS



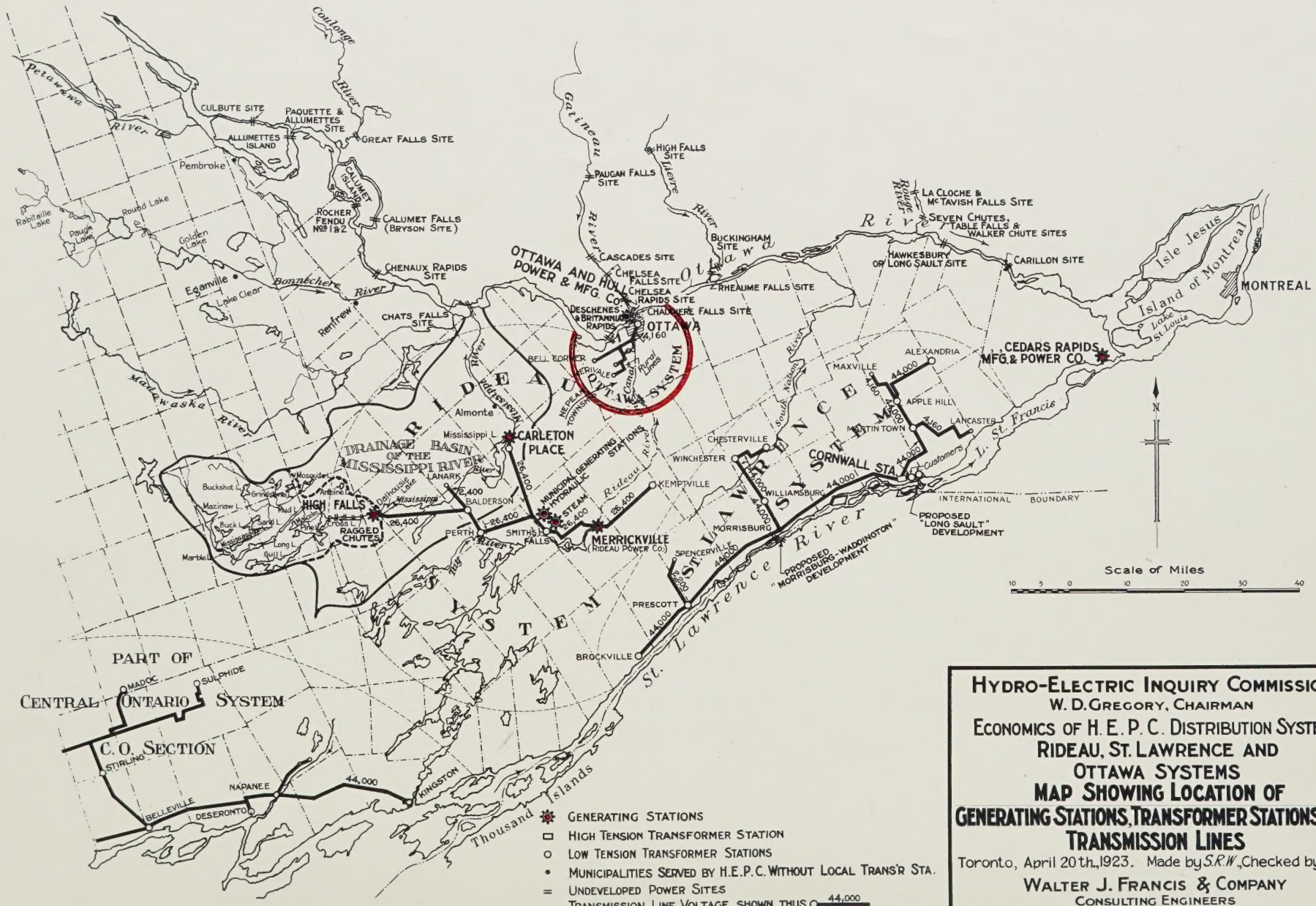
HYDRO-ELECTRIC INQUIRY COMMISSION

GENERAL REPORT

# OTTAWA SYSTEM

JOSEPH H. W. BOWER
SECRETARY

# ÖTZAWA SYSTEM




**HYDRO-ELECTRIC INQUIRY COMMISSION**
W. D. GREGORY, CHAIRMAN

ECONOMICS OF H. E. P. C. DISTRIBUTION SYSTEMS
RIDEAU, ST. LAWRENCE AND OTTAWA SYSTEMS

**MAP SHOWING LOCATION OF GENERATING STATIONS, TRANSFORMER STATIONS AND TRANSMISSION LINES**

Toronto, April 20th, 1923. Made by S.R.W., Checked by W.D.G.

WALTER J. FRANCIS & COMPANY
CONSULTING ENGINEERS

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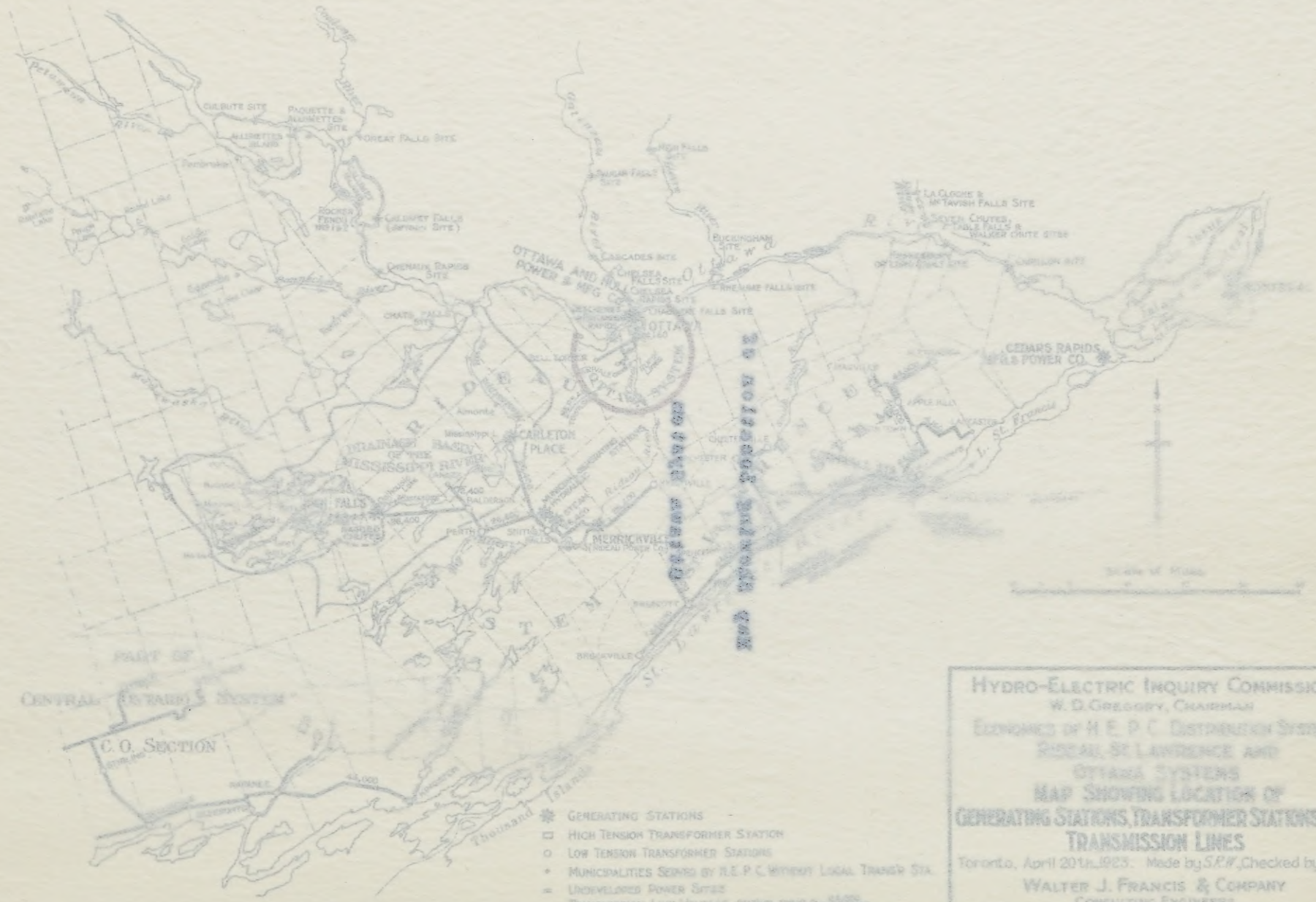
on the

## OTTAWA SYSTEM


Petawawa River
Ottawa River
Gatineau River
Rideau River
Mississippi River
Madawaska River
Lake Ontario
Lake Erie
St. Lawrence River
Thousand Islands
Pembroke
Mattawa
Ottawa
Carleton Place
Merrickville
Smiths Falls
Perth
Brockville
Cornwall
Montreal
Quebec
Gatineau Falls
Chelsea Falls Site
Chelsea Rapids Site
Cascades Site
Chaudiere Falls Site
Rideau Falls Site
Buckingham Site
Sugar Falls Site
High Falls
Chats Falls Site
Dennain Rapids Site
Cedars Rapids
Cedars Rapids Power Co.
La Cloche & McTavish Falls Site
Seven Chutes, Table Falls & Walker Chute Site
Gilbite Site
Paquette & Mamette Site
Great Falls Site
Allumettes Island
Rocher Fendu
Calumet Falls (Arnprior Site)
Ottawa and Hull Power & Mfg. Co.
Drainage Basin of the Mississippi River
Drainage Basin of the Ottawa River
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Part of Central Ontario System
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Scale of Miles
Generating Stations
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Rideau, St. Lawrence and Ottawa Systems
Map Showing Location of Generating Stations, Transformer Stations and Transmission Lines
Toronto, April 20th 1923. Made by S.P.W. Checked by
Walter J. Francis & Company
Consulting Engineers

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Toronto, Ontario,
June 11th, 1923.

Hydro-Electric Inquiry Commission,
W. D. Gregory, Esq., Chairman,
Toronto, Ontario.

re: General Report - Ottawa System

Mr. Chairman and Gentlemen:-

In accordance with your instructions, a general report on the Ottawa System has been made, along the lines approved of by the Commission on January 2nd. The work has been done under my direct personal supervision as per your instructions.

The report of Messrs. Price, Waterhouse & Company, together with the report on this system by the Commission's Consulting Engineer, Mr. Walter J. Francis, has been used in the preparation of this report, and in addition complete studies have been made of all evidence taken at the public hearing held in connection with the system.



The report falls naturally into two parts. The first part includes sections entitled "Historical Sketch", "Physical", "General Economics", and "General Relations". These sections are largely a recital of facts, but in addition a considerable amount of evidence has been quoted in order to fairly represent the claims and counter-claims made in connection with the contentious matters brought to the attention of the Commission. The second part of the report entitled "Summary" is merely intended to direct attention to those points which appear to require special consideration by the Commission.

All figures used in this report have been carefully checked by a representative of Messrs. Price, Waterhouse & Company. Evidence and reports forming the basis of this report are appended hereto, and in order to facilitate reference to the documents in question, on the right-hand margin of the report throughout will be found abbreviated references.

Yours very truly,

J. W. Bawden
Secretary

JHWB/G.

Berlin, Germany.
June 5th, 1922.

Mixed-Industry Inquiry Commission,
N. B. Heudorf, Esq., Chairman,
Toronto, Canada.

<u>Re: Second Report - Pierre Dupuy</u>

Dr. Sir:-and Gentlemen:-

In accordance with your instructions, a German report on the German Dupuy has been made, along the lines approved of by the Commission in January last. The work has been done under my direct personal supervision as per your instructions.

The report of Messrs. Prien, Hartwig & Dauer, together with the report on file signed by the German's Counsel Dr. Julius L. Kronig, has been used in the preparation of this report, and in building complete evidence from each of all evidence taken at the public hearing held in Toronto with the Dupuy.

COPY

The report falls naturally into two parts. The first part includes matters entitled "Historical Review", "Dupuy Companies", and "General Relations". These sections are largely a review of facts, but in addition a considerable amount of evidence has been created in order to fairly represent the claims and counter-claims made in discussion with the Canadian authorities subject to the examination of the Canadian. The second part of the report entitled "Summary" is merely intended to direct attention to those points which appear to require special consideration by the Commission.

All figures used in this report have been carefully checked by a representative of Dupuy, Prien, Hartwig & Dauer. Dupuy and counsel treated the books at this representative's disposal, and in order to facilitate reference part are appended herein, and in order to facilitate reference in the discussion in question, on the right-hand margin of the report therefore will be found alphabetical references.

Yours very truly,

[illegible]

[illegible]

# OTTAWA SYSTEM

## HISTORICAL SKETCH

The City of Ottawa is supplied by the Hydro-Electric Power Commission with power which is purchased from the Ottawa & Hull Power & Manufacturing Company, Limited. The township of Nepean is also supplied and a number of rural lines are in operation and under construction in the surrounding district. The Ottawa Electric Company also supplies power in the city in competition with the Commission.



The system had its inception on July 31st, 1907, when the Commission contracted with the City of Ottawa to supply the power required for its municipal operations. On the same day, the Commission signed a contract with the Ottawa & Hull Power & Manufacturing Company to purchase sufficient electric power to meet the requirements of the city. Under this contract the company agreed to sell to the Commission 1,500 electrical horse-power at the flat rate of $15.00 per horse-power year, and to supply additional power at the same rate up to 1,000 horse-power, making a maximum of 2,500 horse-power. The period of the contract was ten years and in it the company agreed to deliver the power to the city at the city limits at Chaudiere Bridge.

WJY.
p.4.

# OTTAWA ELECTRIC

## DIAMOND STORM

The city of Ottawa is supplied by the Ottawa Electric Power Consortium with power which is purchased from the Ottawa & Hull Power & Manufacturing Company, Limited. The township of Nepean is also supplied from a number of rural lines are in operation and under construction in the surrounding district. The Ottawa Electric Company also supplies the city in competition with the Hamilton.



The system had its inception on July 21st, 1887, when the Hamilton contracted with the City of Ottawa to supply the power required for its municipal operations. In the same way, the Hamilton signed a contract with the Ottawa & Hull Power & Manufacturing Company to purchase sufficient electric power to meet the requirements of the city. Point Edge contract the company agreed to sell to the Hamilton 3,000-electrical horse-power at the flat rate of $18.00 per horse-power year, and to supply additional power at the same rate up to 1,000 horse-power, making a maximum of 4,000 horse-power. The period of the contract was not specified in it but the company agreed to deliver the power to the city at the city limits at Chaudiere Bridge.

The power requirements of the city increased very rapidly and soon exceeded the maximum amount available under the contracts mentioned above, and on December 6th, 1910, amendments to both these agreements were signed and made effective, increasing the maximum horse-power available to 4,000 horse-power at the same rate of $15.00 per horse-power year. WJF. p.4.

The load of the city continued to increase rapidly. In 1912 about 3,100 horse-power was being purchased, and by the end of 1913 the demand again exceeded the total amount included in the contracts, thus necessitating further provision for power.



An agreement between the Commission and the company wqs drawn up on December 8th, 1913, superseding all previous agreements between the two parties and providing for the delivery of from 5,000 horse-power to 20,000 horse-power, at rates ranging from $14.00 per horse-power for the minimum requirements to $11.00 per horse-power when the load on the system will have reached 18,000 horse-power. This agreement is to remain in force for a period of thirteen years, and provides, at the option of the Commission, for its renewal for one or two further terms of ten years, notice to be given to the company by the Commission of its intention to renew the agreement at least two years before the expiration of the term of years then in force. WJF. p.5.

The power requirements of the city increased very rapidly and even matched the maximum amount available under the contracts mentioned above, and in February 1912, sometimes in bad light operations were slowed and made difficult, increasing the maximum horse-power available to 4,000 horse-power at the rate rate of 32,40 per horse-power year.

The load of the city continued to increase rapidly. In 1912 about 6,128 horse-power was being generated, and by the end of 1912 the maximum demand reached equal amounts (2,000) in the morning, afternoon and evening, thus demonstrating further greatly the power.

An agreement between the Municipality and the company was drawn up on January 8th, 1913, representing all private agreements between the two parties and providing for the delivery of from 2,000 horse-power to 20,000 horse-power, at rates ranging from £14.22 per horse-power for the minimum requirements to £12.10 per horse-power when the load on the system will have reached 18,000 horse-power. This agreement is to remain in force for a period of thirteen years, and provides, as the right of the Municipality, for its renewal for one or two further terms of ten years, which is to be given to the company by the Municipality if its intention to renew the agreement at least one year before the expiration of the term of power.

There is a clause in this contract prohibiting the company from supplying power to any municipality, person, firm or corporation while such municipality, person, firm or corporation is supplied by the Commission; and at the same time the Commission is restricted to purchasing power entirely from the company for use in Ottawa or within a radius of five miles of the company's power house. P.W. Ex.2, P. 3.

The Order-in-Council approving this agreement is dated March 4th, 1914, and is as follows:

> "Upon the recommendation of the Hydro-Electric Power Commission of Ontario, the Committee of Council advise that the accompanying contract entered into between the Ottawa & Hull Power & Manufacturing Company and the said Commission, bearing date the eighth day of December, 1913, for the supply of from 5,000 to 18,000 horse-power of electrical power at or near the Corporation of the City of Ottawa, be approved by Your Honour." WJP. P.5.



On February 2nd, 1914, an agreement between the Commission and the city was drawn up to conform to the revised agreement made during the preceding December with the Ottawa & Hull Power & Manufacturing Company. This agreement with the city, which supersedes all previous agreements, provides for the purchase of power at rates equivalent to those paid by the Commission to the company, together with operating costs, interest on the capital investment made by the Commission, and payments to the reserve accounts. It is

There is a clause in this company's prohibiting the employing from supplying power to any municipality, state, city or corporation within such municipality, unless the corporation is regulated by the Commission and at the same time the Commission is prevented on purchasing power exclusively from the company for use in towns or within a radius of five miles of the company's power house.

The crack-in-Council explanation this afternoon is dated March 4th, 1914, and is as follows:

> "Upon the recommendation of the Sydney-Glace Bay Power Commission of Sydney, the Question of Council adopted the following resolution at a Council meeting held between the towns a Call Power Station-Sydney Company and the mill Commission, having been the right and of Sydney, for the supply of from 5,000 to 12,000 horse-power of electrical power or so much the capacities of the city of Sydney, as shortened by four hours."

On January 2nd, 1914, the agreement between the Commission and the city was drawn up in question in the very exact expression more during the pressing Sydney with the Sydney a Call Power & Transmission Company. This agreement said with the city, which contained all previous agreements, provides for the purchase of power as rates mentioned on time paid by the Commission to the company, subject with supplying water, interest on the capital invested and by the Commission, and payments to the sinking account. It is

to remain in force for a period of ten years from the date of the first delivery of power under this agreement, and may be continued, at the option of the city, for one or two further consecutive terms of ten years each.

Towards the end of the fiscal year 1917, the Commission placed an order with the company for three blocks of 500 horse-power each, in accordance with the terms of the contract of December 8th, 1913, thus bringing the total power taken to 6,500 horse-power. The additional power was required for the new pumping station of the city located at Lemieux Island. This was put into service on November 12th, 1917, and utilized approximately 2,000 electrical horse-power. The commencement of operations of this pumping station brought about the cancellation of the contract of June, 1916, between the city and the company for the temporary supply of 750 electrical horse-power to the old Queen Street pumping station, the use of which was discontinued. WJY. p.6.

During August of 1920 the company put into operation their No. 2 power house, then recently completed, and shut down their No. 1 plant which had been supplying power to the system. Plant No. 2 then took up the service without any interruption to the operation of the system. The Commission's new metering equipment, which in 1919 replaced the original instruments in use, was later moved

from Plant No. 1 to Plant No. 2 and tested from time to time to insure accurate service.

The demand on the system increased steadily, necessitating orders for additional blocks of power from time to time. The load during October, 1921, 9,098 horse-power, is an increase of about 1,500 horse-power over that in 1920. This was in excess of the amount officially ordered from the power company, and steps were at once taken to provide for further increases. In 1922, the peak demand was 11,394 horse-power, and the load early in 1923 was over 12,000 horse-power. WJP. p.7.



Consequent to applications for electricity made to the Commission, an agreement was entered into with the Township of Nepean on August 25th, 1921, under provisions of the Power Commission Act, "to provide for the supply of electrical energy or power to individual users". An Order-in-Council dated September 20th, 1921, authorized this contract, and also authorized the Commission to construct twelve miles of transmission lines to serve rural districts.

This was followed by Orders-in-Council under dates of November 29th, 1921, and June 23rd, 1922, granting the authority to further construct 6.61 miles and 6.50 miles of transmission lines, respectively.

The construction of rural lines on the system was commenced in September, 1921. The first twelve miles were completed in February, 1922, and certain consumers in Nepean were then served with electrical energy. Six

additional miles of rural lines were completed during October, 1922, all the rural lines serving a total of eighty-five rural consumers at that date. Since then application for electricity has been made by twenty-five other additional customers, and it is stated that the lines to supply these are now under construction.

The rural lines are being served with power from the Ottawa municipal distributing system. The power supplied is being metered by the city which is reimbursed to include the cost of operation, transformation and line losses at an agreed flat rate of $21.00 per horse-power, thus showing operating and transfer costs of $8.00 per horse-power in addition to the wholesale cost of power to the city, which is now $13.00 per horse-power. On June 29th, 1922, the Commission authorized payments to the city for all power supplied to the rural lines of the system at the above rate of $21.00 per horse-power. WJP. p.9.



In connection with rural lines it may be well to note that the Ontario Government has a special act known as the Rural Hydro-Electric Distribution Act, 1921, whereby it may provide up to one-half the capital necessary for primary rural lines under certain conditions. Section 4 of the Act reads as follows:

additional miles of rural lines were completed during October, 1922, all the rural lines serving a total of eighty-five rural customers at that date. Since then applications for electricity have been made by twenty-five other additional customers, and it is stated that the lines to supply these are now under construction.

The rural lines are being served with power from the Wingham municipal distribution system. The power supplied is being metered by the city which is reimbursed to include the cost of operation, transformation and line losses at an annual rate of $41.75 per horse-power, this covering operating and capacity costs at $19.25 per horse-power in addition to the wholesale cost of power in the city, which is now $22.50 per horse-power. In June 28th, 1923, the Commission authorized payments to the city for all power supplied to the rural lines of the system at the above rate of $41.75 per horse-power. [illegible]

In connection with rural lines it may be well to note that the Ontario Government has a special act known as the Rural Hydro-Electric Distribution Act, 1921, whereby it may provide up to one-half the capital necessary for primary rural lines under certain conditions. Section 4 of the Act reads as follows:

COPY

"Where power is supplied to a rural power district under the provisions of the Power Commission Act and amendments thereto there may be paid to the municipality or commission distributing the power in such rural power district under the recommendation of the Hydro-Electric Power Commission of Ontario, and the order of the Lieutenant-Governor in Council, a sum not exceeding fifty per cent. of the capital cost of constructing and erecting in the rural power zone primary transmission lines and cables required for the delivery of power in such rural power districts." WJF. p.9.

# PHYSICAL

## General

The Ottawa System lies north and east of the Rideau System. It now comprises that territory in the Province of Ontario within a radius of about ten miles from the City of Ottawa and includes within its boundaries part of the County of Carleton. At the present time the rural lines extend to Bell Corner and Kerivale to the south and west of the City of Ottawa. WJF. p.9.



Speaking broadly, the system consists of a distributing system supplied by a large privately-owned generating station which serves the city through underground cables, and some rural lines served from the municipal distributing system of the city.

## Generating Stations and Other Sources of Power Supply

The entire power supply for the Ottawa System is purchased from the Ottawa & Hull Power & Manufacturing Company which owns two plants on the Ottawa River at Chaudiere Falls known respectively as Plant No. 1 and Plant No. 2. The water supply for both plants is led from an arch dam about 22 feet high equipped with concrete piers

and wooden stop-logs. This dam is located on the Ottawa River between Ottawa and Hull and is also utilized by the Ottawa Light, Heat & Power Company, as well as by a number of other industries. Plant No. 1, installed in 1902, is situated on Philemon Island above Bridge Street, Hull, Quebec. The water is led through a short concrete head-race to a power house measuring about 90 feet by 180 feet, which contains the following equipment. The initial installation consisted of three Dayton Globe horizontal turbines each of 2,500 horse-power capacity, which are directly connected to three Canadian General Electric 1,500-K. W., 2-phase, 60-cycle, 2,200-volt generators. Six 1,000-kilowatt station transformers step up the energy of these generators to 3 phase, 60 cycles, 11,000 volts. In 1909 there were added two 3,500 horse-power turbines constructed by William Kennedy & Sons, each of which was directly connected to a 2,000-kilowatt, 3-phase, 60-cycle, 11,000-volt generator, made by the Canadian General Electric Company. These units operate at a mean net head of 32 feet. It is understood that the regular operation of this plant was modified soon after the Ottawa & Hull Power & Manufacturing Company completed their new plant, No. 2, and that it has since then been maintained as a stand-by and as an additional source of power during certain periods.

and evening stop-lights. This-line is imposed on the stream-flow between stream and drain and is also utilized by the street lights. Plus a power company, as well as by a number of water industries. Plant No. 3, installed in 1905, is located on Indiana Island above Bridge Street, Gail, Indiana. The water is then diverted a short downstream-way to a power house containing three 22 foot by 102 feet, which contains the turbinal machinery. The initial installation consisted of three Jarvous Blade horizontal turbines rated at 3,200 horse-power apiece, which are directly connected to three Gunnison General Electric 1,250-K. V.. 2-phase, 25-cycle, 2,300-volt generators. The 1,600-kilowatt exciter turbine-generators also on the account of three generators at 2 phase, 25 cycles, 11,000 volts. In 1928 there were added two 3,200 horse-power tri-flow condensers for filling exhaust a last, each of which was directly connected to a 2,500-kilowatt, 2-phase, 25-cycle, 13,200-volt generator, made by the General Electric Company. These units operate at a speed of 200 rpm. It is unnecessary that the regular operation of this plant the machine room after the Ottawa & Gail issue a Hydroelectric Engineer Ainsly start new plant. No. 2, and thus it has since been maintained as a stand-by and as an additional source of power during certain periods.

COPY

Plant No. 2, put into operation during August of 1929, gets its water from the dam through a concrete head-race 300 feet wide and 430 feet long, and is situated adjacent to Plant No. 1. The power house is of concrete and is about 200 feet long by 200 feet wide, and also utilizes a mean net head of 32 feet.

This plant is designed for an ultimate installation of four 7,500 horse-power turbines. The installed equipment at the present time consists of one J. M. Voith 7,500 horse-power horizontal turbine and one Boving 7,500 horse-power horizontal turbine. These are directly connected to two 6,750-K.V.A., 3-phase, 60-cycle, 2,300-volt generators made by the Canadian General Electric Company. The voltage is raised to 11,000 volts by means of individual Delta-Y banks of transformers directly connected to the generators. The two present units operate regularly at about 25 per cent. over their normal rating. It is stated that one additional unit of the same size has been ordered and will be put into Plant No. 2 during the autumn of 1923.



The power supply to the Commission is measured by the Company's meters and checked by the Commission's meters installed in the power house of Plant No. 2, and it is then transmitted to the distributing station of the city through underground cables at 11,000 volts. The Ottawa & Hull Power & Manufacturing Company also sells large blocks

Plant No. 3, pre-line generation overlap commenced
of 1928, with its water from the Kan through a wooden
flume-weir for dry ends and for that site, and is elevated
adjacent to plant No. 1. The power house is of concrete
and is given 200 feet long by 100 feet wide, and also vis-
itors a room for 50 men.

This plant is equipped for an ultimate installa-
tion of four 7,500 horse-power units. The installed
equipment at the present time consists of one 6. 3. Units
7,500 horse-power hydraulic turbine and one 3-line 7,500
horse-power hydraulic turbine. These are directly connected
to the 6,250-K.V.A. 3-phase, 25-cycle, 3,300-volt generators
made by the Canadian General Electric Company. The rating
is raised to 11,000 watts by means of industrial Pyro-T
tubes at transformers directly connected to the generators.
The two present units operate efficiently at rated 25 per cent
over their normal rating. It is stated that the additional
unit of the same size can be installed and will be put into
plant No. 2 during the autumn of 1928.

The power supply to the Chemicals is measured
by the Company's meters and charged by the Municipality's
meters installed in the power house of plant No. 3, and is
in turn connected to the distributing lines of the city
through transformer units at higher voltage. The system a
full power is considerably higher than main lines since

of power to the Ottawa Light, Heat & Power Company, to the Hull Electric Company, and to a large number of important industries located in the district of the city.

The Ottawa & Hull Power & Manufacturing Company is said to be contemplating the development of 30,000 or 40,000 horse-power in 1923 or 1924 at Bryson, Quebec, on the Ottawa River at Calumet Island. WJF. p.10 p.12 p.13.

Undeveloped Power Sites

There are numerous undeveloped power sites within easy transmission distance of the Ottawa and the Rideau Systems, that include land and water rights both in the Provinces of Quebec and Ontario or in Quebec alone. A list of the more important of these is given on pages 14 and 15 of our Consulting Engineer's report. WJF. p.13.



Miscellaneous Power Plants

There are several hydro-electric developments of magnitude in the district besides the plants of the Ottawa & Hull Power & Manufacturing Company, a description of which is given on pages 16, 17 and 18 of our Consulting Engineer's report.

Transmission Lines

Up to October 15th, 1922, the Commission had constructed a total of eighteen miles of low voltage trans-

of power by the steam light, that a Tower Insurance, the Gull Electric Company, and as a large number of important industries located in the district of the city.

The Tower & Gull Power & Manufacturing Company is said to be contemplating the development of 30,000 or 40,000 horse-power in land or land at Pegwell, Ramsgate, on the Steam Side of Galmore Island.



## Electrified Tower Bridge

There are numerous technicians going also which may transmission distance of the Thames and the Eastern Counties, that including the water mains with to the Darkness of Tunis and Bakerin on in Tunis state. A line of the more Superior or Jewel is right on Quiny Jo and is of our Commiting Engineer's report.

## Electrified Tower Bridge

There are several light-electric arrangements of importance in the district besides the plans of the Tower & Gull Power & Manufacturing Company, a description of which is given on Page 14. If and is of our Commiting Engineer's report.

## Conversion Lines

In an earlier life, Jack, the Tunisian Ex-electrician - ended at Hybrous mile a of 3mm voltage power-

mission lines forming a 4,160-volt network, supplying the rural districts in Nepean.

There are no high voltage transmission lines in the system that are owned by the Commission. The City of Ottawa gets its power supply at 11,000 volts delivered through the high voltage transmission lines of the Ottawa & Hull Power & Manufacturing Company to the Ottawa City limits, at Chaudiere Bridge, from where it is taken to the Ottawa substation at the same voltage by means of underground cables which form part of the city's electrical distributing system. WJP. p.19.



Transforming & Distributing Stations

The Commission does not own any transforming substations on the system. The City of Ottawa steps down its power for municipal distribution by means of its own transforming equipment, and also steps down the power for transmission to the rural district for which it receives remuneration as already noted at the rate of about $8.00 per horse-power in addition to the price billed to the city for power supply. WJP. p.19.

Local Distributing Systems

With the exception of the rural lines already mentioned, the Commission does not distribute retail power

plaining these results a clear-cut network supplying the rural districts in Depoem.

There are no high voltage transmission lines in the district yet owing to the distances. The city of Ottawa uses its own power to light its streets while the rural districts receive electrical energy by the steam a small power a hydro-electrical company in the Ottawa City District, in Ontario Province. Even which is in fact on the steam power which-lies in the hands of a private company owned and its under the ward of the city's electrical distributing system.



Transformer & Distributing Stations

The transformer used are not one may transformed substations on the system. The city of Ottawa which even its power the distributed electricity by means of its own transformer stations, and also steps down the power for consumption in the rural districts. The point is reached consumption on circuit which at the rate of about 24,000 per hour. Ottawa is unique in the value which is the city for power supply.

Rural Distributing System

With the exception of the rural line system mentioned, the transmission does not electrons reach more

to consumers on the system. The Commission acts as a wholesale distributor only, and in the City of Ottawa the electricity is distributed by a local commission appointed solely for that purpose. It is understood that the accounting for this city is done in accordance with the standard accounting system of the Commission and the details are given in the Annual Reports.

WJF. p.19 & 20.

# GENERAL ECONOMICS

## Capital Investment

As all power required for the Ottawa System is purchased from, and delivered to a receiving station of the local Hydro-Electric Commission of the City of Ottawa by the Ottawa and Hull Power & Manufacturing Company, the Commission's investment in this system is very small.

Up to the end of the fiscal year 1920, the only property owned by the Commission in connection with the system was certain metering equipment in the power house of the Ottawa and Hull Power & Manufacturing Company, valued at $1,009.57. All transformers, transmission lines and other equipment utilized in distributing power in the City of Ottawa are owned by the local Hydro-Electric Commission of Ottawa. P.W. p.7.



Under authority of Orders-in-Council dated September 20th, 1921, November 29th, 1921, and June 23rd, 1922, the Commission commenced the construction of rural lines for the purpose of serving rural customers in Nepean Township and up to September 30th, 1922, had expended $32,053.12 on such lines. P.W. p.4. P.W. p.5.

## GENERAL STATEMENTS

### Capital Investment

As all power requires for its fullest giving it generated from, and delivered to a receiving station of the local Hydro-Electric Commission of Ontario by the City of Ottawa, the Ottawa and Hull Power & Manufacturing Company, the Commission's investment in this system is very small.

Up to the end of the fiscal year 1920, the only property owned by the Commission is connected with the system was certain material supplied to the power house of the Ottawa and Hull Power & Manufacturing Company, valued at $1,000.00. All transformers, lightning arresters and other equipment utilized in distributing power in the city of Ottawa are owned by the Local Hydro-Electric Commission of Ottawa.

Under authority of Hydro-Electric Power Commission Act, 1921, December 23rd, 1921, and June 22nd, 1922, the Commission assumed the distribution of power since the purchase of existing local companies in Ottawa terminated and up to September 30th, 1921, had expended $22,242.12 on such lines.

The following table shows the Commission's investment in the system from 1913 to 1922 inclusive:

| | Fiscal years ending October 31st | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1913 to 1915 | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 |
| Metering Equipment | $432 | $432 | $432 | $591 | $1,009 | $1,009 | $1,009 | $1,009 |
| Rural Lines | - | - | - | - | - | - | 4,698 | $32,053# |
| Totals | $432 | $432 | $432 | $591 | $1,009 | $1,009 | $5,707 | $33,062 |

# to September 30th, 1922, only. P.W.-p.25

In accordance with the recommendations of the Commission and pursuant to section 4 of the Rural Hydro-Electric Distribution Act, 1921, Orders-in-Council under the dates previously mentioned, and in the amounts set forth below, were passed providing that 50% of the cost of constructing the primary rural lines in Nepean Township should be borne by the Province of Ontario as follows:



| Date of Order-in-Council. | Estimated Miles of Lines. | Number of Applicants for Power. | Estimated Cost of Primary Lines 100% | 50% | |
|---|---|---|---|---|---|
| Sept.20,1921 | 12.00 | 51 | $15,146.00 | $7,573.00 | P.W. |
| Nov. 29,1921 | 6.61 | 27 | 7,176.83 | 3,588.42 | p.4. |
| June 23,1922 | 6.50 | 14 | 8,273.16 | 4,136.58 | |
| | 25.11 | 92 | $30,595.99 | $15,298.00 | |

As at October 31st, 1921, the engineers of the Commission estimated that additional funds in the amount of $90,000.00 would be required for the construction of rural lines in Nepean Township during the years 1922 and 1923.

The following table shows the Commission's investment in the system from 1910 to 1922 inclusive:

Street railway and power plant

| | 1910 to 1920 | July 1920 | June 1921 | July 1921 | June 1922 |
|---|---|---|---|---|---|
| Hydro-Electric Development | $ | $ | $ | $ | $ |
| Rural lines | | | | | |
| Totals | | | | | |

* to December 31st, 1922, only.

In accordance with the recommendations of the Commission and pursuant to section 4 of the Hydro-Electric Distribution Act, 1921, Toronto-Hamilton rates are later previously mentioned, and in the country not yet with rates, were passed providing that 90% of the cost of constructing the primary rural lines in Ontario Township should be borne by the Province of Ontario as follows:

| Date of order-in-Council. | Estimated Number of miles of lines. | Number of applicants for power. | Estimated Cost of Primary lines 1922 | 20% |
|---|---|---|---|---|
| Sept.20,1921 | 12.00 | 21 | $12,142.00 | $2,428.40 |
| Dec. 19,1921 | 6.01 | 27 | 7,172.35 | 1,434.47 |
| June 22,1922 | 4.21 | 13 | 1,272.16 | 254.43 |
| | 22.11 | 61 | $20,586.51 | $4,117.30 |

In mid October 21st, 1921, the engineer of the Commission estimated that additional funds in the amount of $25,000.00 would be required for the construction of rural lines in Ontario township during the years 1921 and 1922.

If these expenditures are carried out, the total investment in the system at the close of the fiscal year 1923 will amount to approximately $96,000.00, a part of which will be borne by the Province as provided for above.

Reserve for Renewals

No provision was made up to October 31st, 1921, for the renewal of the properties in the system, it having been stated that in the opinion of the engineers of the Commission no provision was considered necessary. In the future, however, a renewals account will probably be set up for rural lines.



At October 31st, 1921, the total depreciable capital was the whole of the capital investment in the system, namely, about $6,000.00, while no reserve for renewals had yet been established at that date. At September 30th, 1922, the depreciable capital was about $33,000.00, and if the proposed extensions be carried out will be about $96,000.00 at October 31st, 1923, unless the Province assumes part of the costs of the rural lines, which would correspondingly reduce the depreciable capital. WJY. p.37

Our Auditors have stated that although the capital investment is small, it is their opinion that the practice of the Commission should be uniform in providing for renewals, and the Ottawa System should not be an exception in this respect. P.W. p.8.

it shows commitments for supplies etc. the total investment in the system at the close of the fiscal year 1938 will amount to approximately $16,000,000.00 part of which will be borne by the Province as provided for above.

Cheque for Payment

In preparation was made up to October 31st, 1938, for the record of the payments in the system, it having been stated that in the opinion of the engineers of the commission no payments are immediately necessary. In the future, a separate cheque will probably be set up for each item.

COPY

At October 31st, 1938, the total expenditure against the whole of the original investment in the system, amounting, since 1934, to $6,000,000, while on reviewing the records had been established at that date. At December 31st, 1938, the expenditure amount was about $10,000,000, and if the proposed extensions be carried out will be about $18,000,000 at October 31st, 1939, subject to Province commencing paid of the water at the first time, which would materially reduce the depreciation amount.

The engineers then stated that although the engineering investment in small, it is their opinion that the question of the Hamilton should be matters to practically for remarks. 3.0. 3.0.

The system Chairman should not be an exception in this respect.

**Reserve for Sinking Fund**

The sinking fund payments by the City of Ottawa together with interest accumulated thereon to October 31st, 1921, amounted to $88.62, which is applicable to the investment in the metering equipment of the Commission in the Ottawa and Hull Power & Manufacturing Company's generating plant. P.W. p.8.

The first rural line expenditures were made in 1921 so that the collection of sinking fund chargeable against these rural lines will doubtless be commenced in the years 1926 and 1927, or five years after the date of first operation.



**Reserve for Contingencies**

Up to the end of 1921 no reserve for contingencies had been established. Our Consulting Engineer expressed the opinion that with the operation of rural lines and the heavy losses which might be occasioned to them by accident, a suitable rate per horse-power consumed to rural customers or other means be found so that a sufficient sum might be available to be drawn on in case of emergencies. When a fund of about $5,000.00 will have been built up the rates can be readjusted to suit the conditions after several further years of operation. AJF. p.37

## Issues for Starting Year

The starting date depends on the date of giving approval with lowest estimated charge is Jaffar 1951, amounted to 320.52, which is equivalent to the lowest in the material expenses of the Commission in the minimum and full power a manufacturing Company's generating plant.

The first round line expenditures were made in 1951 so that the equipment of electric power transmission system which must start with installation of economical in the years 1954 and 1955 and 1956 years after the date of first operation.

## Reserve for Contingencies

Up to the end of 1951 no reserve for contingencies had been established. Our Consulting Engineer expressed his opinion that with the operation of rural lines the total losses which might be occasioned to them by accident, a suitable rate per horse-power measured in rural measures or other means be issued as this a reflection can might be available in 24 hours on in case of emergencies. Such a fund of about 25,000.00 will have been built up the rates can be increased to suit the conditions after several further years of operation.

Accounts Receivable

The accounts receivable of $19,483.21 due by the City of Ottawa as at October 31st, 1921, was paid in full prior to December 31st, 1921.

Results of Operation

Under the terms of a contract mentioned heretofore, the Commission supplies power to the City of Ottawa on a cost basis, which includes the cost of operating, maintaining, repairing, renewing and insuring the lines, stations and works, interest on the capital invested in the system, and an amount sufficient to provide sinking fund for the repayment of the capital in thirty years.



The following is an operating account for the four years ending October 31st, 1921, showing total revenue, cost of power purchased, operating expenses and fixed charges (cents omitted):

| | 1918 | 1919 | 1920 | 1921 |
|---|---|---|---|---|
| Revenue | | | | |
| From the City of Ottawa | $82,276 | $86,844 | $95,622 | $104,087 |
| Cost of operating, including portion of administrative expenses | | | | |
| Power purchased from the Ottawa & Hull Power & Manufacturing Co., Ltd. | $81,611 | $86,218 | $94,700 | $103,329 |
| Operating Expenses | 627 | 572 | 854 | 690 |
| Interest on capital invested | 28 | 40 | 50 | 50 |
| Provision for sinking fund | 10 | 14 | 18 | 18 |
| Total Costs | $82,276 | $86,844 | $95,622 | $104,087 |

## Abbotts Township

The amount of $19,[illegible] due by the City of Ottawa as at December 31st, 1921, was paid in full prior to December 31st, 1921.

## Equity of Township

Under the terms of a contract mutually [illegible] Township, the Commission supplies power to the City of Ottawa on a mass basis, which includes the cost of operating, maintaining, repairing, renewing and improving the lines, substations and works, between the point of [illegible] and the original boundary of the Township, and an annual contribution to provide sinking fund for the replacement of the equipment and buildings.

The City is in operating arrangement for the first power coming between Jan. 1st, 1923, showing total revenue, cost of power purchased, operating expenses and [illegible] charges (cash outlay):

| | 1919 | 1920 | 1921 | 1922 |
|---|---|---|---|---|
| **Revenue** | | | | |
| From the City of Ottawa | [illegible] | [illegible] | [illegible] | [illegible] |
| Deduct: Operating, maintenance and depreciation of equipment, transmission expenses | | | | |
| Power purchased from the Ottawa & Hull Power & Manufacturing Co.,Ltd. | [illegible] | [illegible] | [illegible] | [illegible] |
| Operating expenses | [illegible] | [illegible] | [illegible] | [illegible] |
| Interest on capital | 46 | 47 | 50 | 50 |
| Provision for sinking fund | 32 | 34 | 36 | 38 |
| Total items | [illegible] | [illegible] | [illegible] | [illegible] |

| | 1918 | 1919 | 1920 | 1921 | |
|---|---|---|---|---|---|
| Total Horse-power purchased and billed | 5829 | 6158 | 6764 | 7654 | P.W. Ex.4. |
| Cost per horse-power billed | $14.11 | $14.10 | $14.14 | $13.59 | |

From the above, it will be noted that the City of Ottawa has been charged with the total cost of all power supplied to it excepting provision for renewals and contingencies as previously commented upon.

The following table indicates the annual cost figures as percentages of the total cost of power per annum:



| | Fiscal years ending October 31, 1918 | 1919 | 1920 | 1921 | |
|---|---|---|---|---|---|
| Power purchased | 99.20 | 99.27 | 99.05 | 99.28 | |
| Overhead & General Expenses | 0.76 | 0.66 | 0.89 | 0.66 | WJP. |
| Interest | 0.03 | 0.06 | 0.05 | 0.05 | p.36 |
| Sinking Fund | 0.01 | 0.01 | 0.01 | 0.01 | |
| | 100.00% | 100.00% | 100.00% | 100.00% | |

A comparison of the cost per horse-power purchased by the Commission and the cost to the City of Ottawa as billed by the Commission is as follows:

| | Cost per h.p. purchased | Cost per h.p. to City of Ottawa | |
|---|---|---|---|
| 1918 | $14.00 | $14.11 | |
| 1919 | 14.00 | 14.10 | P.W. |
| 1920 | 14.00 | 14.14 | p.8. |
| 1921 | 13.50 | 13.59 | |

| | 1919 | 1920 | 1921 | 1922 | |
|---|---|---|---|---|---|
| Total Horse-power generated and sold | 4223 | 5130 | 5744 | 7280 | 7,1% |
| Cost per horse-power sold | $14.11 | $14.10 | $14.14 | $14.42 | 3%,4% |

From the above, it will be seen that the City of Ottawa has been charged with the total cost of all power supplied by it exclusive of the revenue from municipal lighting at practically commercial rates.

The following table indicates the annual cost figures as presented at the annual meeting of Ottawa City Council

Ottawa Power Purchasing Service 32.

| | 1919 | 1920 | 1921 | 1922 | |
|---|---|---|---|---|---|
| Power purchased | 12,22 | 12,27 | 12,21 | 12,22 | |
| Interest & Sinking Fund charges 0.22 | 1,22 | 1,22 | 1,22 | 0,22 | 112, |
| Interest | 0,02 | 0,04 | 0,02 | 0,02 | 3,22 |
| Sinking Fund | 0,22 | 0,22 | 0,22 | 0,21 | |
| | 13,22 | 13,22 | 13,22 | 12,22 | |

A comparison of the unit cost for horse-power purchased by the Commission and the cost to the City of Ottawa as billed by the Commission is as follows

Ottawa Hydro-Electric Service

| | Cost per h.p. | Cost per h.p. 22 |
|---|---|---|
| 1919 | $12.22 | $14.11 |
| 1920 | 12.22 | 12.22 | 2,1% |
| 1922 | 12.22 | 12.22 | 2,4% |
| 1921 | 12.20 | 12.22 | |

The rural lines in Nepean Township were placed in operation in February, 1922, and as the accounts for the year ending October 31st, 1922, are not yet available, they have not been included in this report.

However, it might be well to mention that power required for these rural lines is purchased from the City of Ottawa at $21.00 per horse-power or approximately $8.00 per horse-power more than is paid for power supplied to it; this difference is represented by the estimated cost of $4.00 for transformation, $3.00 for a proportionate part of the use of the distribution system and $1.00 for transmission at 10,000 volts.



In addition to the cost of power of $21.00 per horse-power, the customers on the rural lines pay the operating and maintenance expenses of the lines, interest on capital invested therein, provision for renewals and sinking fund on a twenty year basis.

## POWER DATA

### Population Served

The district served by the Ottawa System is both urban and rural, nearly all of the load being in the City of Ottawa.

"Municipal Statistics" of the Province of Ontario for 1921, gives a total population of about 146,000 for that

The rural lines in Saxon township were added in December in February, 1922, and as the accounts for the year ending December 31st, 1922, are not yet available, they have not been included in this report.

However, it might be well to mention that power required for these rural lines is purchased from the City of Ottawa at $21.00 per kw-year or approximately $0.25 per kw-hour more than is paid for power supplied to its this difference is represented by the estimated loss of $1.00 for transformer-rent, $2.00 for a proportionate part of the use of the distribution system and $1.00 for transmission at 10,000 volts.

In addition to the cost of power of $21.25 per kwh-year, the maintenance on the rural lines for the standing and maintenance expenses of the lines, interest on capital invested therein, provision for renewals and sinking fund on a 25-year basis.

## POWER DATA

### Population Served

The districts served by the Ottawa Operation is both urban and rural, nearly all of the load being in the City of Ottawa.

"Municipal Statistics" of the province of Ontario for 1921, gives a total population of about 16,000 for the

portion of Carleton County which is tributary to the Ottawa System. At December 31st, 1921, the total population in the City of Ottawa was 110,708 with 11,532 consumers served by the local municipal commission. WJF. p.20.

The Ottawa Light, Heat & Power Company serves the rest of the consumers in that city, and is also the sole distributor of power in the Town of Eastview and in the district between Britannia and Ottawa. From the total of about 55,000 population for the suburban territory included as the Ottawa System, about 10,000 might be deducted as the population served by the Ottawa Light, Heat & Power Company. During 1922 the Commission had constructed about eighteen miles of rural lines in the Township of Nepean, thus serving a rural population of about 3,000 or 4,000, the number of consumers being about eighty-five at October, 1922, and the remaining tributary population of about 20,000 or 22,000 can only be supplied by a fairly extensive system of rural lines.



The City of Ottawa was billed with 7,654 horse-power in the fiscal year 1921. In 1922 the total power billed to the system was 9,135.7 horse-power, of which an amount of about 25 horse-power was taken at the end of 1922 by the rural customers in Nepean Township. Judging by the steady increase in the number of consumers taking power from the municipal distributing system in the City

portion of Quinten County which is tributary to the Ottawa System. At December 31st, 1921, the total population in the city of Ottawa was 114,795 with 23,202 consumers served by the local municipal commission.

The Ottawa Light, Heat & Power Company serves the rest of the consumers in that city, and is also the sole distributor of power in the Town of Deseronto and in the adjacent Township Pritchard and Ottawa. From the total of about 34,000 population for the municipal territory located on the Ottawa System, about 12,000 might be considered as the population served by the Ottawa Light, Heat & Power Company. During 1921 the commission had constructed about eighteen miles of rural line in the Township of Ottawa, thus serving a rural population of about 2,400 or 6.90%, the number of consumers being about eighty-five at October, 1921, and the remaining tributary population of about 20,000 or 82.97% can only be supplied by a fairly extensive system of rural lines.

The city of Ottawa was billed with 7,804 horse-power in the fiscal year 1921. In 1922 the total power billed to the system was 9,124.7 horse-power, of which an amount of about 12 horse-power was taken at the end of 1921 by the rural consumers in Ottawa Township. Noting by the steady increase in the number of consumers taking power from the municipal distributing system in the city

p.24.

of Ottawa each year, it is expected that the increase during 1923 will be about 600 consumers of all classes taking about 1,000 horse-power. This growth can be accounted for by the fact that the City of Ottawa sells power to consumers at a somewhat lower rate than its competitor, the Ottawa Light, Heat & Power Company.

The following table gives in detail the number of consumers at the end of the fiscal year 1921 in the City of Ottawa, the only place served by the Commission. It also gives the approximate horse-power billed in 1921, and the average horse-power per consumer in 1921:



| | |
|---|---|
| Population ..... | 110,708 |
| Number of Consumers ..... | 11,532 |
| Percentage of Consumers to Population ... | 10.5 |
| Horse-power Billed in 1921 ..... | 7,654 |
| Billed horse-power per Consumer ..... | 0.66 |
| Billed horse-power per Capita ..... | 0.06 |

WJP. p.21

**Growth of Market and Ultimate Sources of Power Supply**

Since the commencement of operations of the Ottawa System in 1907, the growth of the demand of the Ottawa Municipal System has been fairly rapid. It has increased from about 1,200 horse-power in 1907 to an average of about 9,100 horse-power in 1922, with a maximum peak of about 11,400 horse-power during that year. The following table shows the growth of the population of the City of Ottawa, and the number of consumers taking the Commission's

of Ottawa each year, is to expropriate the Ottawa-Eastern Power Commission and to issue 100 debentures of $1,000 each, bearing interest at 4.5% per annum. This growth can be measured for by the fact that the city of Ottawa spent in power in consumers is a thousand times very than the expenditure, the Ottawa Light, Heat & Power Company.

The following table gives in detail the number of consumers on the end of the fiscal year 1921 in the city of Ottawa, the only place served by the Commission. It also gives the approximate power bills in 1921, and the average horse-power per consumer in 1921:

| | | |
|---|---|---|
| Population | 120,000 | |
| Number of Consumers | 21,000 | |
| Proportion of Consumers to Population ... | 18.0 | |
| Horse-power Bills in 1921 | 7,000 | 117, |
| Bills horse-power per Consumer | 7.04 | 3.33 |
| Bills horse-power per Capita | 0.05 | |

## Growth of Ottawa and Ultimate Income of Power Commission

Since the commencement of operations at the Ottawa Station in 1911, the growth of the demand of the Ottawa Municipal System has been fairly rapid. It has increased from about 1,250 horse-power in 1911 to an average of about 6,000 horse-power in 1921, with a maximum year of about 11,000 horse-power during that year. The following table shows the growth of the population of the City of Ottawa, and the number of consumers taking the Commission's

power from 1913 to 1921 inclusive:

| Year | Total Number of Consumers | Population |
|---|---|---|
| 1913 | 6,756 | 100,180 |
| 1914 | 7,350 | 100,180 |
| 1915 | 8,538 | 101,785 |
| 1916 | 9,207 | 100,163 |
| 1917 | 10,007 | 100,500 |
| 1918 | 10,436 | 100,561 |
| 1919 | 10,393 | 107,752 |
| 1920 | 10,939 | 107,752 |
| 1921 | 11,532 | 110,708 |

WJF. p.22.



The problem of serving rural customers is difficult, the average number of consumers per mile of transmission line being small. The experience of the Commission up to the present time indicates that only three or four consumers per mile, on the average, are obtainable. At October 31st, 1922, the number of consumers served by the Commission in the rural districts of the Ottawa System averaged 4.7 per mile of line.

The situation at the present time is that the Ottawa System can purchase an abundant power supply at a very favourable price, thus enabling the City of Ottawa to sell electricity for lighting and other purposes at lower rates than those in most Canadian cities. That the people are satisfied with the service rendered by the municipal distributing system is self-evident from the fact that each year since its inception the

power from 1913 to 1921 inclusive:

| Year | Total Number of Customers | Population |
|---|---|---|
| 1913 | 6,745 | 100,100 |
| 1914 | 7,308 | 100,100 |
| 1915 | 8,088 | 101,700 |
| 1916 | 9,888 | 101,300 |
| 1917 | 12,897 | 100,300 |
| 1918 | 13,603 | 100,101 |
| 1919 | 13,372 | 107,704 |
| 1920 | 14,920 | 107,707 |
| 1921 | 11,352 | 110,700 |



The preceding table shows that assuming in 1915-
1916, the average number of customers per mile of transmission
line being small. The experience of the Commission up to the
present time indicates that only there do that customers per
mile, on the average, are maximum. At Grande Ronde, 1915,
the number of customers served by the Commission in the rural
districts of the Union System averaged 4.7 per mile of line.

The situation in the present time is that the Union
System can purchase as commodity power supply at a very favor-
able price, thus enabling the "Ir" of towns to well distribute
the lighting and other purposes at lower rates than those in
most Foundation cities. That the people are satisfied with the
service rendered by the municipal distributing system is evi-
denced from the fact that each year since its inception the

number of consumers and the demand for power have increased. The domestic power market in the City of Ottawa at the present time has been well covered, and unless the city grows rapidly a large increase in the load of the Commission can only take place by further accretions of consumers from the privately-owned company and by the increased use of current per capita. Both of these factors are evidently influencing the growth. On the other hand, the indications are that there is likely to be a large demand for power for pulp and paper developments, for smelting, and for general manufacturing purposes, provided large blocks of power could be made available in the Ottawa District. The development of one or two of the sites previously mentioned, which it is anticipated will be carried out in the very near future, will provide ample capacity to supply the demands for electricity of the Ottawa System and district for a long time to come. If the Ottawa and Rideau Systems be extended southwards and eastwards and the St. Lawrence System be extended northwards, it is possible that in the future inter-connecting lines may be constructed so that any of these systems might receive power from the water powers of the Ottawa and Gatineau Rivers, or from the water powers of the St. Lawrence River if these be developed. Because of the networks of high voltage transmission lines now in existence, the Commission could purchase large blocks of power under wholesale conditions from the

privately-owned plants mentioned above, and should be enabled to successfully compete with other distributors of power in the districts of these systems. It would appear feasible that agreements could be made with large private producers of power to prevent duplication of transmission lines in the districts served by the Commission and thus permit the Commission to serve the whole of the eastern portion of Ontario without competition.

WJP.
p.24.

privately-owned power undertaking entry, and should be combined to incorporate energy with other distributors of power in the districts of Niagara Peninsula. It would appear feasible that arrangements could be made with large private producers of power to provide supplemental transmission lines in the districts served by the Commission but than giving the Commission an entry into the whole of the western portion of Ontario without competition.

VAN.
2.24.

## GENERAL RELATIONS

On the 13th of March, 1923, pursuant to their request, representatives from the Ottawa Electric Company appeared before this Commission and voiced several complaints against the administration of the Ottawa Hydro-Electric Power Commission. During the course of the hearing it was brought out that the Ottawa Electric Company had been in existence for over twenty-five years. In 1900 the Company was practically wiped out by the big fire in Ottawa and during the rebuilding of plant and lines in the following years, another company, known as the Consumers' Electric Company was organized and obtained a franchise from the city in 1901.



Ev. 3743 3744 3745

Competition took place between the two companies, and as a result rates were gradually reduced. In 1904 the two companies got together and a Bill was introduced in the Dominion Legislature allowing the Ottawa Electric Company to absorb the Consumers' Electric Company. This Bill was defeated by so small a majority that it was again introduced in 1905 and it became certain that it would pass. The promoters admitted that the intention was to raise the rates and in view of the

Letter J.A.Ellis to Sir Adam Beck 3/9/08.

HEPC. Report 1909 p.118.

## GENERAL RELATIONS

On the 12th of March, 1951, pursuant to their powers, representatives from the Atomic Electric Utility Commission before this Commission and raised serious complaints against the administration of the Atomic Electric Power Commission. During the course of the hearing it was brought out that the Atomic Energy Commission had been in existence for over twenty-five years. In 1927 the Commission was particularly asked out to the big fire in Ottawa and during the revolution at Quebec and Ilsen in the following year, another emergency. Before so the Commission's Electric Energy was expanded and obtained a franchise from the city in 1951.

Competition took place between the two companies, and as a result rates were drastically reduced. In 1934 the Commission requested the Legislature and a bill was introduced in the Ontario Legislature allowing the Atomic Electric Company to absorb the Commission's Electric Energy. This bill was enforced by an small majority but it was again introduced in 1935 and it became certain that it would pass. The promoters claimed that the information was to make the rates and in view of the



Letter
Dated
1934
Dtd.

Letter
Dated
1935
Dtd.

Letter
Dated
1935
Dtd.

monopolistic condition that this would bring about the Municipality of Ottawa decided to buy out the assets of the Consumers' Company, consisting of a distributing plant. Their authority to do this was by virtue of special legislation in 1894 and a clause in the Consumers' Electric Company's franchise.

The city then entered into a contract for the supply of power, but the entire transaction was attacked by the Ottawa Electric Company which brought an action to have the purchase set aside for want of authority. It was held by the Court of Appeal that the municipality had no authority to contract for the purchase of power for a period exceeding the term of the Municipal Council then in office. Steps were taken to bring the action before the Privy Council, but in the interim the first Power Commission Act was passed which allowed the municipality to purchase power from the Power Commission. This of course obviated the necessity of a Privy Council Appeal and the suit was settled.

12 Ont. Law Reports. p.290.



One of the difficulties between the two companies had been the cutting of rates and one of the objects, which the city had in requesting the Power Commission to enter this field, was to act as a regulator of rates for the city.

At the present time the Ottawa Electric Company claims to have twice as many customers and to sell three times as much power as the Ottawa Hydro-Electric Commission.

Ev. 3754

The Commission on the other hand has the entire street lighting load.

The first complaint voiced by the Ottawa Electric Company was: "That the Hydro service at Ottawa is conducted for the benefit of the patrons of the Hydro Electric who are very much in the minority, being a grave injustice to all the other citizens, very much in the majority, who do not use Hydro service, and many of whom do not use electric service." In connection with this complaint it was stated by the company "that the profit derived from street lighting enables the Hydro management in this city to discriminate in rates or in methods of charging. It would appear that electricity is being sold in some cases below cost for reasons that are obvious." Ev. 3753 Ev. 3758



Mr. J. A. Ellis of the Ottawa Hydro-Electric Commission pointed out that during the years 1916 to 1921, the Commission lost $23,000.00 on street lighting. It was acknowledged that the domestic rates were low, being 2 cents, 1 cent and one-half cent, and in fact Mr. R. T. Jeffrey stated that Ottawa was the only municipality with the one-half cent rate at the present time. Mr. Jeffrey further stated that a recommendation had been made to the Ottawa Commission by the Hydro-Electric Power Commission of Ontario to discontinue the one-half cent rate, but this recommendation had never been acted upon. Ev. 3766

In defense of retaining the one-half cent domestic rate, Mr. Ellis stated that during the past year the Ottawa Commission had shown a gross surplus of $85,733.71 of which $36,743.43 was set off against depreciation, leaving a surplus of $48,990.28. Ev. 3821.

He said:

> "How on earth could we, out of a total revenue from street lighting of $44,633.90, make all that money? . . . . . If every cent of the street lighting was profit it would not account for our surplus." Ev. 3821.

And later:

> "The profit comes absolutely and entirely from domestic lighting and commercial." Ev. 3826



Mr. Ellis gave as one reason for the retention of the one-half cent rate the fact that the Ottawa Electric Company also operated a gas works and offered a discount of five per cent. on gas bills if the consumer took both gas and electric service from the company.

He said:

> "They charge too much for gas and they discriminate as against Hydro customers in their gas bills, in other words, a customer who will take electric current from the company gets his gas 5% cheaper than if he takes his electric current from us." Ev. 3829.

A further claim was made by the Ottawa Electric Company to the effect that the books of the Ottawa Hydro-Electric Commission were not audited properly. It was shown, however, that all vouchers were passed upon by the municipal auditor, and that at least once a year the auditor from the Hydro-Electric Power Commission, Head Office,

In defence of retaining the one-half cent domestic rate, Mr. Hills argued that during the past six years the Ontario Commission had earned a gross surplus of $20,724,71 on which $20,724,42 was met out of current revenues. Leaving a surplus of $28,000.29.

He said:

"Can an earned surplus be, not of a fair return from street lighting of $24,000.30, made all that amount? . . . . . If every cent of the street lighting was profit it would not account for our surplus."

Ibid. 37.

Ibid. 38.

Ibid. 39.

Ibid. 40.

Ibid. 41.

He said:

"The profit earned disinterestedly and entirely from municipal lighting can be considerable."



Mr. Hills gave as one reason for the reduction of the 1/2-half cent rate the fact that the Ottawa Electric Company also operated a gas works and achieved a dividend of five per cent. So did Hills if the revenue from hydro and electric service from the municipality.

He said:

"They charge for such, for gas and they distribute as a regular Hydro municipality in their city. Hills, in their works, a business who will take electric current from the company gets his gas 3¢ cheaper than if he takes his electric current from us."

Ibid. 42.

A further claim was made by the Ottawa Electric Company in the matter also the basis of the Ottawa Hydro-Electric Commission were not realist property. It was argued, however, that all members were pleased upon to the municipal ownership, and that on least one of the matters the Hydro-Electric Power Commission, Dana Hills,

checked over the accounts to see that they were properly classified, and that the books were in proper shape. Ev. 3788.

Mr. R. C. McCollum from the head office of the Commission stated that the municipal auditor at Ottawa was responsible for the municipal Hydro-Electric accounts and that the Commission, through its auditors, installed a similar bookkeeping system in every Hydro muhicipality, in order that there might be uniformity in the keeping of accounts, particularly with respect to the classification of expenses. Ev. 3850

He said:

"I have never felt my need to worry about the Ottawa accounts or their revenue." Ev. 3856.



Mr. Dion, of the Ottawa Electric Company, pointed out that, while the potential water powers in the vicinity of Ottawa were large, the present power situation was serious, all the company's power was being used up and during the past winter their steam stand-by plant was working a great portion of the time. He stated that the one-half cent rate encouraged the use of electricity for heating and cooking, and said: Ev. 3801

"The wisest policy under these conditions it seems to me would be not to go very much out of our way to coax the building of big loads. If a customer comes to me and wants electricy, he is going to get it, but why coax, by this very low rate, to have them increase their loads. We are going into a blind alley, and Hydro is going into it and we have got to follow, we cannot turn down our customers, that is why werconsider the situation is very serious." Ev. 3802

advance over the Ontario. We can take care perhaps
analyzed, and that our trouble was in proper study.

Mr. E. C. Cronkite: Does the head office of
the Commission find that the municipal factors in
these two requisite for the municipal light-and-power
associations and that the Commission, through its motives,
installed a electric heating system in every light-
municipality, in order that there might be uniformity
in the keeping of accounts, particularly with regard to
the classification of expenses.

He said:

"I have never felt anyone is using the
Ottawa Hydro's system."

Mr. Dies, of the Ottawa Hydro-Electric,
stated was that, while the personnel water power in the
vicinity of Ottawa were large, the present power situation
was unique, in the company's power was being used to use
during the peak-load time their steam electric plant was work-
ing a great portion of the time. He stated that the ave-
rage rate charged for the use of electricity the
heating and cooking and said:

"The street policy under which municipalities it means
is no right to do so very much out of our way
to meet the building of big loads. If a customer
comes to us with a definite proposition, we do
not to Hydro, we should have this say we
have this increase this load. We are going into
a plant with, and there is going time it was we
put it, but why when, by this very far ever, to
have the heating and cooking, and the ultimate is
very welcome.

Mr. Ellis in reply to the above statement said:

"With regard to the half-cent rate, there is a very difficult problem that we have got to deal with, it is entirely different from any other municipality, and that is the cooking by electricity and the half cent rate is what encourages it, there is no doubt about that. With regard to the power, let me say that the half cent rate has been bound up with this question of the supply of power, and I do not know of any place in Canada that is more favourably situated in regard, not only to the present supply of power but a future supply of power than the City of Ottawa." Ev. 3823

He pointed out that there were many large undeveloped power sites in the vicinity of Ottawa, that the growth of the city was slow, and that



" . . there is any quantity of water power available, there is no doubt in the world about that . . . we won't need it all or anything like it." Ev. 3824

Extracts from our Consulting Engineer's report covering the growth of the market and the ultimate sources of power supply are given on pages 22, 23, 24 and 25 of this report.

Another complaint made was that the Ottawa Power Commission paid in taxes only $1,675.21 and that the total taxes of the Ottawa Electric Company in 1922 amounted to $78,000.00. Ev. 3756

The following is an extract from the evidence in connection with the discussion of taxes:

Mr. Hills in reply to the above statement said:

"With regard to the half-mile rule, there is a very difficult problem that we have yet to deal with. It is entirely different from any other municipality, for what is the meaning of electricity and the half mile is what encourages it. There is no doubt about that. With regard to the power, let me say that the half mile rule has been being up with this province at the rapidly at very, and I do not mean at any place in Canada that is more fundamentally situated in regard, and rapidly as power from the city of Ottawa." Dr. 2002

He pointed out that there were many large water-
storing dams still in the vicinity of Ottawa, that the
growth of the city was slow and that

" . . there is any quantity of water power available. There is no doubt in the world about time . . . we won't need it all or anything like it." Dr. 2222

Extracts from the Consulting Engineer's report
concerning the growth of the market and the financial returns
of power supply are given on pages 22, 23, 24 and 25 of
this report.

Canadian Engineers note the fact that the Ottawa Dra-
matic year is there only $1,670.32 and that the total
income of the Ottawa Electric Company in 1923 amounted to
$72,000. Dr. 2242

The following is an extract from the evidence
in connection with the financing of Ottawa:

Mr. Ellis - " . . . Speaking for the Commission, we do not care whether we pay taxes or not . . ."

Q - "You would not offer any opposition to a change in the by-law which would put you on the same footing as others in the matter of taxes?"

A - "No . . ."

Ev. 3812

# S U M M A R Y

In the foregoing sections of this report, comment has been introduced from time to time to make the various statements clear. In addition to statements of fact, obtained from the Auditor's and Engineer's reports, certain evidence has been quoted in connection with the claimsadvanced by representatives of the Ottawa Electric Company. It is believed that the evidence quoted fairly represents the claims and counter-claims made in connection with the contentious matters brought to the attention of the Commission. In order to direct attention to the matters on which the Commission may desire to give decisions hereunder is given a brief summary of the points which appear to require special consideration.



Inception of System - ("Historical Sketch" - p.1.)

The system had its inception on July 31st, 1907, when the Commission contracted with the City of Ottawa to supply power required by the municipality. On the same date, the Commission signed a contract with the Ottawa & Hull Power & Manufacturing Company to supply power in various amounts at a fixed price. As the requirements of the City of Ottawa grew, contracts for a supply of power were amended and changed to suit the changed conditions.

# S U M M A R Y

In the Inter-Dominion negotiations the report, commenced has been interrupted from time to time to make the various administrative steps. In addition to acknowledgments of Ministers, notices have the Minister's and Chairman's reports, matters have been quite in accordance with the electrification of Parliament of the Union Government. It is believed that the attached report mainly representing the Commission's-relations made in accordance with the Commission matters brought in the authorities of the Dominions. It remains to direct attention to the matters on which the Commission may desire to give legislative sanction; it also a joint account of the private which appear to require special consideration.



Transition of Service - ("Historical Sketch" - p.1.)

The scheme had its inception on July 26th, 1907, when the Commission commenced with the day of issue to supply power required by the municipality. On the same date, the Commission signed a contract with the Citizens & Bell Power & Manufacturing Company to supply power in various municipal as a first step. In the circumstances of the city of Ottawa then, constituted the a supply of power was entirely manifested in this the chosen essentials.

Physical Characteristics of the System - ("Physical" - p.8)

The system consists of a distributing system supplied by a large privately owned generating station which serves the city through underground cables, and some rural lines served from the municipal distributing system of the city.

Commission Wholesale Distributor

With the exception of the rural lines, the Commission does not distribute retail power to consumers on the system, but acts as a wholesale distributor only.



Capital Investment - ("General Economics" - p.14)

Up to the end of the fiscal year 1920, the Commission only owned metering equipment in the power house of the Ottawa & Hull Power & Manufacturing Company valued at $1,009.57. Under authority conferred September 20th, 1921, November 29th, 1921, and June 23rd, 1922, the Commission constructed rural lines in Nepean Township and their investment as at September 30th, 1922, amounted to $32,055.12 on such lines. In accordance with Section 4 of the Rural Hydro-Electric Distribution Act of 1921, half of this cost is borne by the Province of Ontario.

According to the estimates of the engineers of the Commission, additional funds for the construction of rural

Typical Characteristics
of the System - ("Objects" - p.8)

The system consists of - distributing power supplied by a large privately owned generating station which serves the city through underground mains, and some rural lines served from the municipal distributing system of the city.

Insulation Problems Interfering

With the exception of the rural lines, the insulation does not disturbance rural power to operators on the system, but acts as a minimum distributor only.



Public Interest - ("General Remarks" - p.14)

By the end of the fiscal year 1934, the commission only owned material equipment in the year term of the system a full power a constructing temporary values at $1,000.00. Under authority approved September 20th, 1933, November 27th, 1931, and June 22nd, 1932, the Commission constructed rural lines in Kenora Township and their investment as at September 30th, 1934, amounted to $12,262.11 on such lines. In accordance with section 4 of the Rural Electric Distribution Act of 1931, half of this cost is borne by the Province of Ontario.

According to the estimates of the engineers of the Commission, additional funds are required at least

lines in this district during the period 1922 to 1923 will amount to $90,000.00. If these expenditures are made at the close of the fiscal year 1923, the total investment in the system will be approximately $95,000.00, a part of which investment will be provided by the Province.

Reserve for Renewals - ("General Economics" - p.16)

Up to October 31st, 1921, no provision was made for renewals in respect of depreciable capital, which amounted at that date to about $6,000.00. Depreciable capital at September 30th, 1922, amounted to $33,000.00 and at October 31st, 1923, if present plans are completed, the amount of the depreciable capital will be materially increased. We understand that the Commission has set up a renewal reserve for rural lines from the date of commencement of operation.



Reserve for Sinking Fund - ("General Economics" - p.17)

Amounts in respect of sinking fund have been provided for in accordance with the Power Commission Act.

Reserve for Contingencies - ("General Economics" - p.17)

Up to October 31st, 1921, no reserve for contingencies had been established. Our Consulting Engineer expresses the opinion that, with the operation of rural lines and the heavy losses which might be occasioned to them by accident, under the present investment a fund of about $5,000.00 should be built up.

time to give farmers during the period this is not just amount to $10,000,000. If these experiments are made on the close of the fiscal year 1929, the total investment in the province will be approximately $40,000,000, a part of which investment will be provided by the farmers.

Source for Demands - ("Annual Economics" - p.12)

By the autumn 1929, 20 provinces and some the remainder in regions of comparatively mixed-farming at that time it will be $10,000,000. Comparable expires on September 30th, 1929, amount to $28,000,000 and on December 31st, 1929, it grows and employed, the amount of the approximately capital will be materially increased. In addition that the Quadrilaterals has set up a planned program for rural lines from the date of commencement of operations.

Source for Jinking Fund - ("General Economics" - p.17)

Amounts in regard of members from have been provided for in accordance with the Provincial Government.

Source for Provincial - ("General Economics" - p.17)

By the autumn 1929, 20 farmers for constructing grades has been related. The Provincial Engineer approves the rights that, with the provision of small lines and the Dairy Farmers which right be constructed by them to assistant, under the private farmers a fund of about $2,000.00 should be built up.

Accounts Receivable - ("General Economics" - p.18)

There are no accounts receivable by the Commission outstanding against the system,-the amount of $19,483.21 was due at October 31st, 1921, but was paid in full prior to December 31st, 1921.

Total Revenues - ("General Economics" - p.18)

The results of operation show that revenue has met all charges during the period of operation. The revenue increased from $82,276.00 in 1918 to $104,087.00 in 1921. It is to be noted, however, that power bills to the City of Ottawa did not provide for renewals and contingencies.



Power Costs - ("General Economics" - p.18)

Our Consulting Engineer shows that in the year 1921 99.28% of the cost of power to consumers is represented by the purchase price. The balance of .72% being made up of overhead and general expense, interest and sinking fund. In the year 1921, the cost of the power purchased was $13.50 per horse-power and the cost to the City of Ottawa was $13.59 per horse-power.

The rural lines purchased their power from the City of Ottawa at the rate of $21.00 per horse-power, the extra cost representing the cost of transforming a proportionate part of the use of the distribution system and $1.00 for transmission at 10,000 volts. In addition the rural customers

Letters Receivable - ("General Economics" - p.18)

There are no accounts receivable by the Commission maintaining against the system,-the amount of $19,493.21 was due on October 31st, 1921, but was paid in full prior to December 31st, 1922.

Total Revenue - ("General Economics" - p.12)

The results of operation show that revenue has not all charged during the period of operation. The revenue increased from $22,372.00 in 1919 to $193,807.00 in 1923. It is to be noted, however, that power still is the city of Toronto and particularly for industrial and municipalities.

Power Sales - ("General Economics" - p.18)

Our Municipal Engineer whose star is on the rise 1921 $3.25% of the cost of power to consumers in Toronto of the purchase price. The balance of .72% being made up of overhead and capital expense, interest and sinking fund. In the year 1923, the cost of the power purchased was $12.80 per horse-power and the cost in the city of Toronto was $12.80 per horse-power.

The rural lines purchased their power from the city of Ottawa at the rate of $13.00 per horse-power, the entire cost representing the cost of transmission, distribution and $1.00 per transmission of 12,000 volts. In addition the rural consumers

pay operating and maintenance expenses of their lines, interest on capital invested, and provision for renewals and sinking fund.

Population Served & Growth of Market - ("General Economics" - p.20)

The total population of the area tributary to the Ottawa System is 146,000 persons. The total population of the City of Ottawa at the end of 1921 was 110,708 of which number 11,832 were served by the local Hydro Commission, the Ottawa Electric Company serving the rest of the consumers in that city. This company is also the sole distributor to the Town of Eastview and in other districts contiguous to the City of Ottawa. Thus it will be noted that the number of consumers taking power from the Commission in relation to the population of the district is relatively small and this is accounted for by the fact that the Ottawa Electric Company is in competition with the Commission and serves a greater number of customers than does the Ottawa Hydro-Electric Commission.



The growth and demand of the Ottawa Municipal System has been fairly rapid, increasing from a load of about 1,200 horse-power in 1907 to an average of about 9,100 horse-power in 1922, the maximum peak for 1922 being about 11,400 horse-power. The growth and the power demands have been much in excess of the increase in population, which from 1913 to

1917 was steady at about 100,000 persons, increasing to only 110,700 in 1921. Thus it would appear that, with the services afforded by the introduction of hydro power and the distribution of power by the private companies, the power market in the City of Ottawa is at the present time being very well covered, and it would appear that the Ottawa Commission can only increase its load by further accretions of consumers from the privately owned company or by the increased use of current per capita.

Relations with Ottawa Electric Company - ("General Relations" - p.26)



The Ottawa Electric Company claim to have twice as many customers and to sell three times as much power as the Ottawa Hydro-Electric Commission. The Commission on the other hand has the entire street lighting load. The company had three main complaints which may be summarized briefly as follows:

1. Criticism of the rates charged by the local Commission which are on the basis of 2¢, 1¢ and ½¢ per kilowatt hour.

2. That the books of the Ottawa Hydro-Electric Commission were not properly audited.

3. That the Ottawa Hydro-Electric Commission was practically exempt from taxation, paying in 1922 only $1,675.21, while the Ottawa Electric Company in the same year paid $78,000.00.

Referring to the above complaints it would not appear that any unfair advantage was being taken by the local Hydro-Electric Commission of Ottawa in their rate making, and

Ottawa Electric Transmission of Ottawa is about this matter, and that any market advantage was being taken by the local Hydro-Electric Commission of Ottawa in their rate making, and

Referring to the above complaints it would appear that the Ottawa Hydro-Electric Commission in 1922 only $2,272,311 while the Ottawa Electric Company in the same year paid $72,267.--.

Referring to the above complaints it would appear that any market advantage was being taken by the local Hydro-Electric Commission of Ottawa in their rate making, and

Ottawa Electric Power Commission - ("General Information" - p.86)

The Ottawa Electric Company claim in their rates as many customers and to sell about about as much power as the Ottawa Hydro-Electric Commission. The domestic on the right hand for the water heater lighting line. The company has three main complaints which may be summarized briefly as follows:

1. Division of the rebate charged by the local Commission which are on the basis of $7 - 3% net if your account paid.

2. That the rates of the Ottawa Hydro-Electric Commission have not generally reduced.

3. After the Ottawa Hydro-Electric Commission was practically asked from Ottawa, during the company in the same year paid $72,267.--.
In 1922 only $2,272,311 while the Ottawa Electric

on the contrary that they had built up a very substantial surplus representing profit on the basis of the rates used.

It should be noted that the Hydro-Electric Power Commission of Ontario has recommended to the local Commission that the 3¢ rate be discontinued though the recommendation has not been acted on. The Ottawa Electric Company claimed that this low rate encouraged the inefficient use of electricity for purposes such as heating and cooking. This whole question may well be the subject of a report by this Commission.



With respect to the second complaint regarding the auditing of the books of the local Commission, it would appear from the evidence given that these were kept in conformity with the standards as laid down by the Hydro-Electric Power Commission of Ontario, and that the Hydro-Electric Power Commission had exercised due supervision over the matter of keeping their accounts.

Referring to the matter of taxation, it is well to keep in mind that the Hydro-Electric Power Commission of Ontario together with the local Hydro Commission of the City of Ottawa have relatively small amount of capital invested inasmuch as they own and operate no generating station. Consequently a straight comparison between the taxes paid by the Commission and the Ottawa Electric Company is rather misleading. On the other hand, a certain element of unfairness seems to exist in any municipality where a private company

and a Commission are in competition and whereby under the provisions of the Power Commission Act, the publicly owned utility is practically exempt from all taxation, while the privately owned enterprise must pay taxes in proportion to the amount of its investment in works and structures. It would appear that where such a condition exists some consideration should be given to the advisability of the local Commission or the Ontario Commission being taxed on the same basis as private companies. Mr. Ellis, Chairman of the local Commission, when discussing the question of taxes at the hearing said: "We do not care whether we pay taxes or not", and when questioned stated that he would not offer any opposition to a change in the by-law which would put his Commission on the same footing as a private company.